

04. Low-fi Prototype & Evaluation

Team Mango
May 3, 2023

Team Mango

Homeschool Education



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Problem
Space
&
Solution

Problem Space + Solution Overview

All students deserve access to a quality education.

Not all homeschooling parents have the resources or experience to provide such an education, leading to unequal outcomes during schooling and later in life.



We want to level the playing field and provide resources for homeschooling parents to be better equipped and more empowered in their teaching, *for their kids*.

Mission Statement

Value
Proposition

Mission Statement



Our mission is to empower homeschooling parents with tools for effective teaching and feedback delivery. We are dedicated to equipping parents as they seek to create engaging and inspiring learning environments at home.



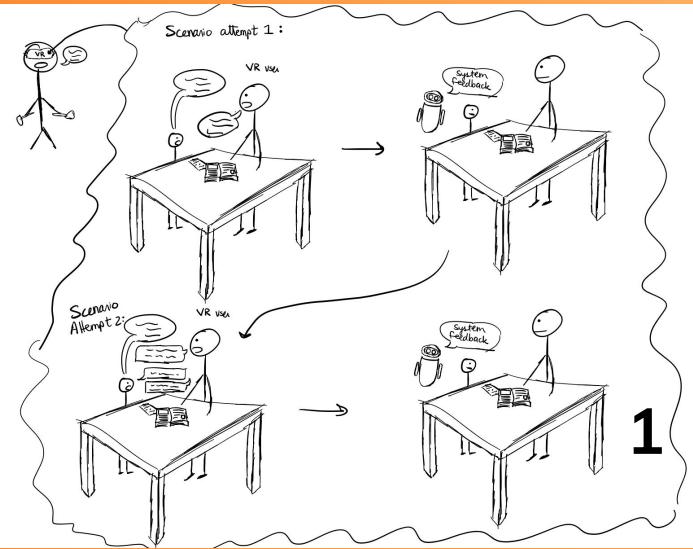
Value Proposition

1. **Personalized Feedback Solutions:**
 - a. Live lesson tracking and generated reports to help parents tailor feedback strategies to their child's individual needs
 - b. Actionable insights and recommendations

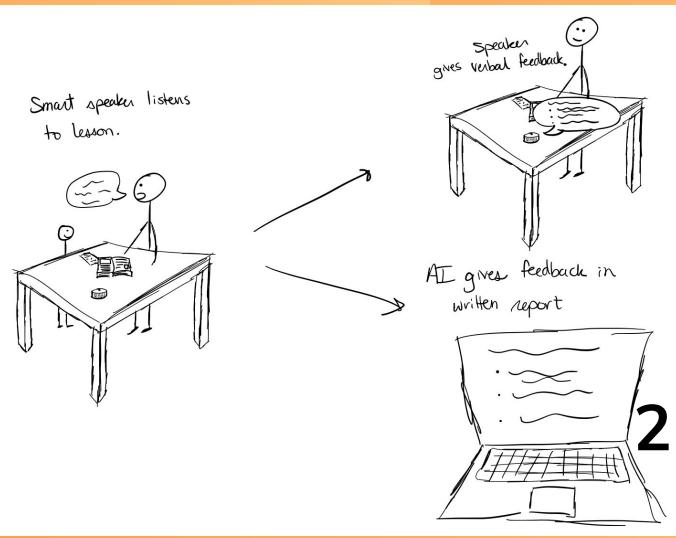
2. **Empowerment and Confidence:**
 - a. Through insights on live lessons and simulations, gain experience and confidence in teaching

Concept Sketches

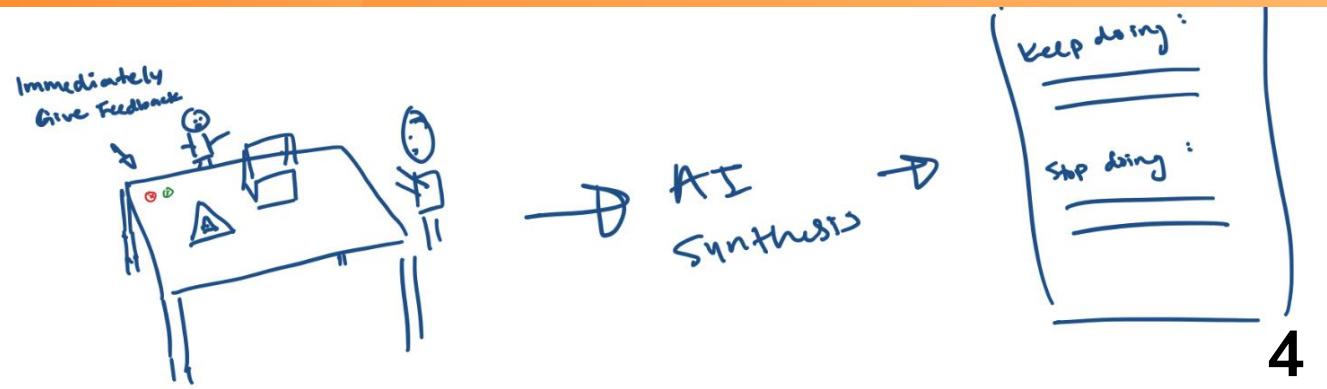
1. Virtual Reality



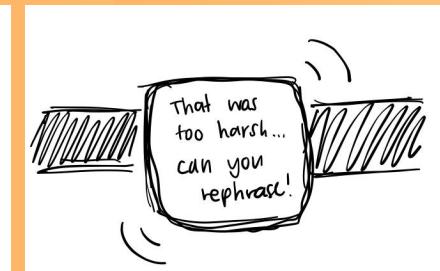
2. Smart speaker



4. Table-top interface



3. Wearable



Welcome Back!

Get feedback

Give feedback

5

Get Feedback

Subject: Math, History, Art, Science, Music, English

Grade: Kinder, First, Second, Third, Fourth, Fifth, Sixth, Seventh, Eighth, Ninth, Tenth

GO!

Submitted Scenario

What went well:

What could be improved:

Send Feedback

Background

Lesson Plan Feedback Submit

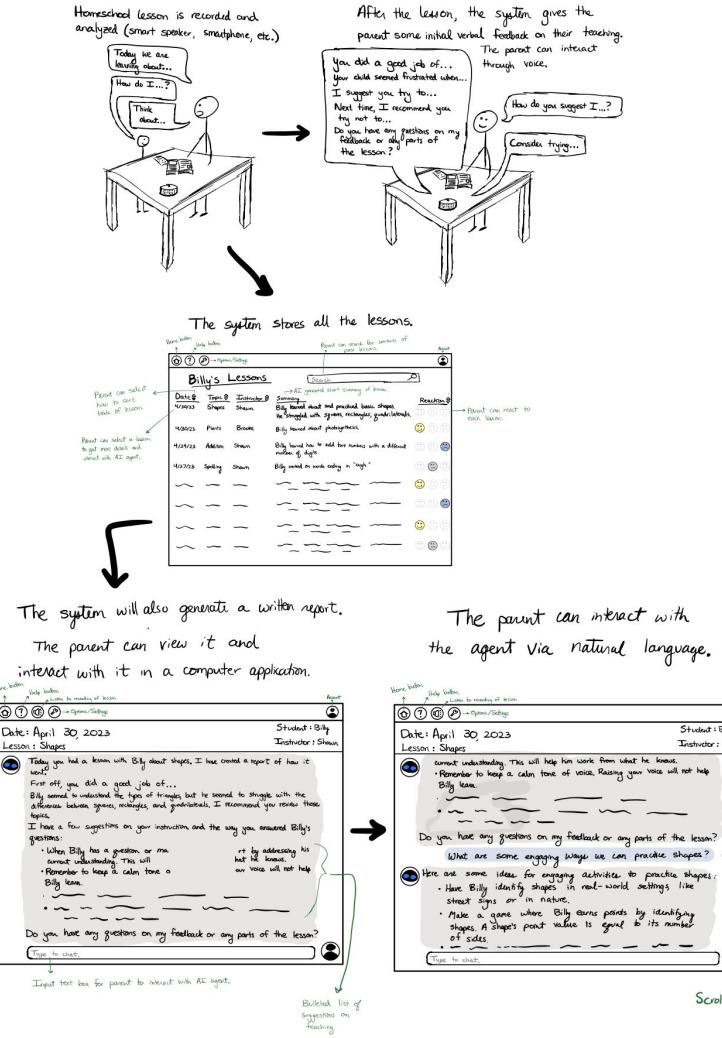
Feedback
You did well!
You could improve on
Going forward, try

5. Mobile app

Storyboards

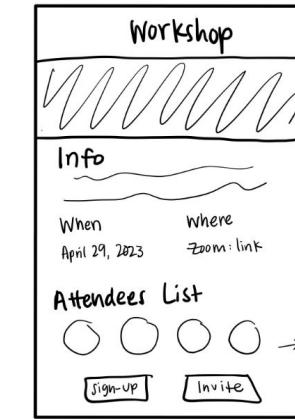
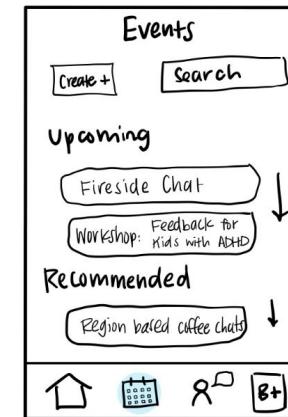
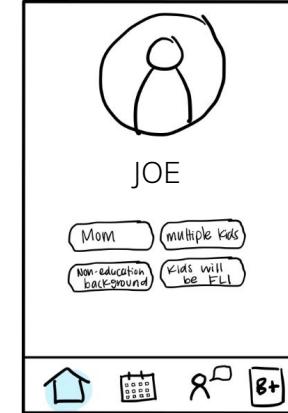
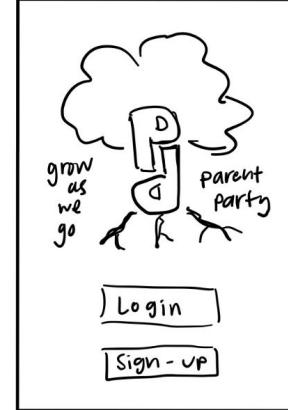
AI lesson recorder + post-lesson feedback generation

Storyboard 1:



Storyboard 2:

ParentParty: Feedback Workshops for Parents



Pros

- Creates community, options for communities with people of similar identities
- Encompasses intersectionality of identity, connections
- Provides resources to support under-resourced parents trying to support their kids
- Collaboration and knowledge-sharing
- Feels more personal

Cons

- Requires more effort/intentionality from parents
- Less inclusion of the child in the process
- Dependent on a social network for growth and retention

Pros

- Live data collection
- Easier for parent, no burden of time
- Takes child's learning into account in real lesson
- Data collection - makes it easier to track progress over time
- Opt in for data collection for fine tuning model

Cons

- Privacy issues with recording
- May feel impersonal
- Not immediate feedback for each lesson - just have the AI listening in
- The set-up might be difficult for people unfamiliar with the technology

Parent Party

Live Feedback

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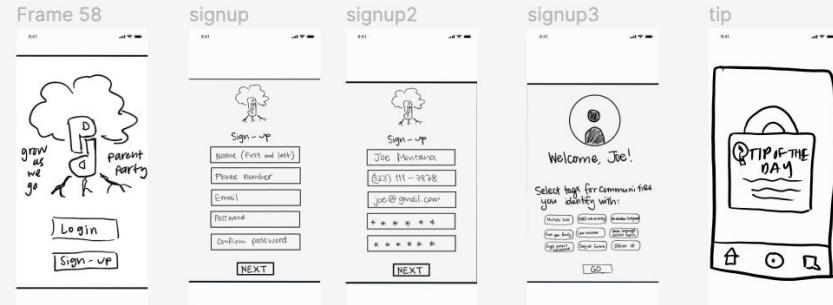
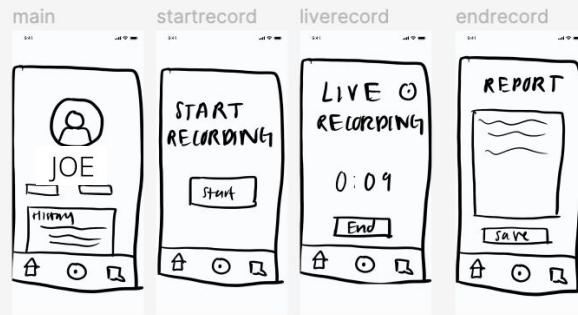
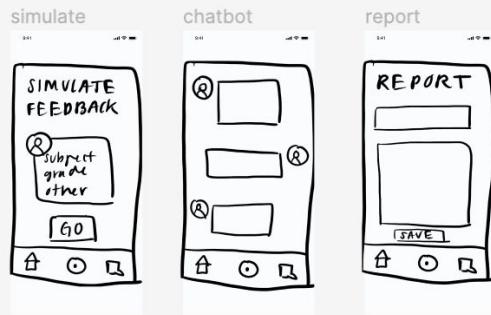
Parent Party

Live Feedback

Prototype



Scan me!



Experiment

Participants

Homeschooling
mother of 3
(Zoom)



Homeschooling
father of 2
(Zoom)



Homeschooling father
of 4
(In-person)



Mother of 4,
homeschooling
youngest 2
(Zoom)



Tasks

Tasks

Task 1



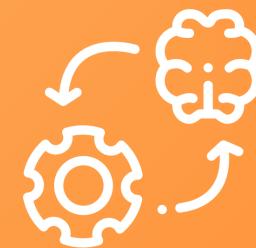
Sign-up and find the
“Tip of the Day”

Task 2



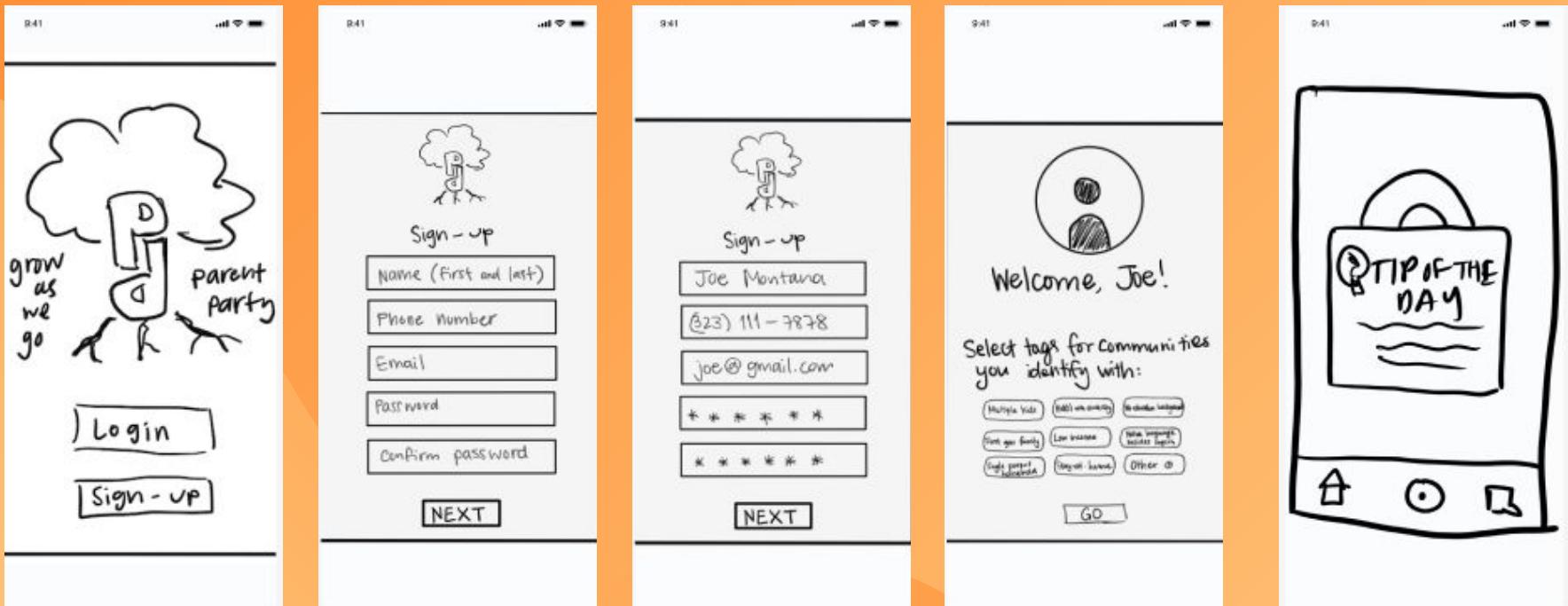
Record a live lesson and
view generated feedback

Task 3



Participate in teaching
and feedback simulation

1: Tip of the Day (simple)



Task 1

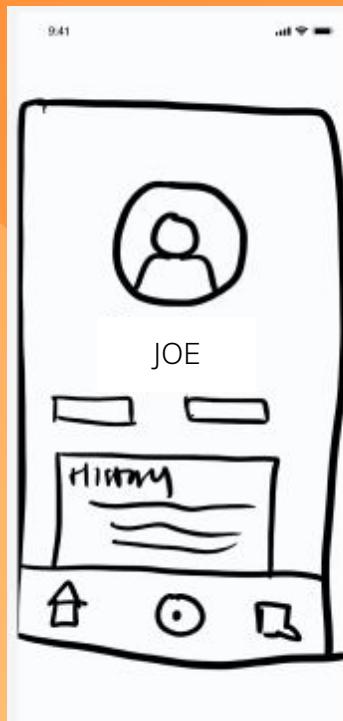


Sign-up and find the
“Tip of the Day”

Procedure:

- Sign-up for the app
- Find the tip of the day generated for you.

2: Live Recording (moderate)



Task 2



Record a live lesson and view generated feedback

Procedure:

- “Record” a live lesson and interact with the feedback given by the app
- Teach on a short pre-created curriculum
- Answer student questions
- Interact with the feedback that is given to you after teaching the lesson

Lesson Plan on the Water Cycle

1. Introduction:

- Explain the significance of the water cycle, highlighting that it is the continuous movement of water on Earth and that all living organisms depend on water for survival.
- Mention that understanding the water cycle helps us predict weather patterns, conserve water resources, and maintain ecological balance.

2. Explaining the Water Cycle:

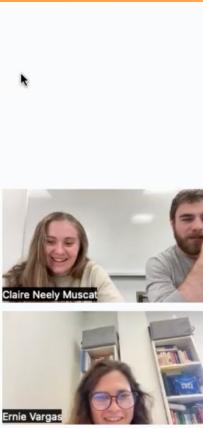
- Provide a more detailed explanation of the water cycle, emphasizing that it involves four main processes: evaporation, condensation, precipitation, and runoff.
- Explain that the water cycle is driven by the sun's heat energy, which causes water to change states and move between the Earth's surface and the atmosphere.

3. Evaporation:

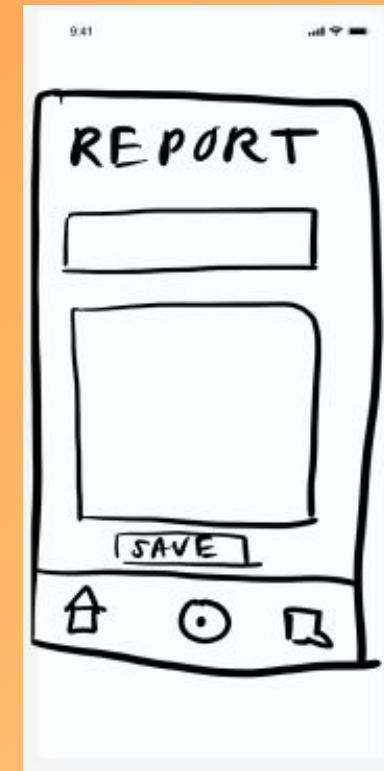
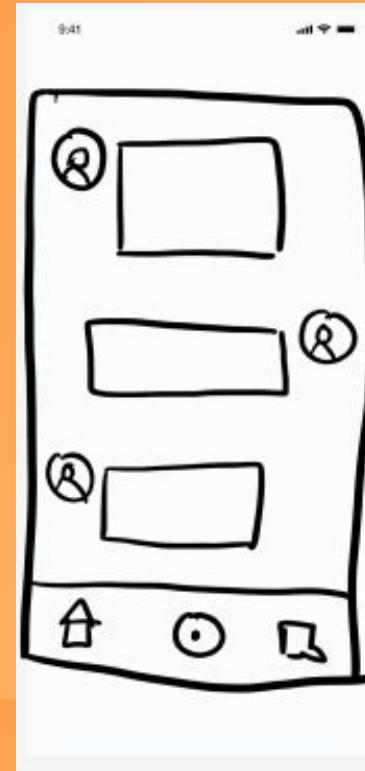
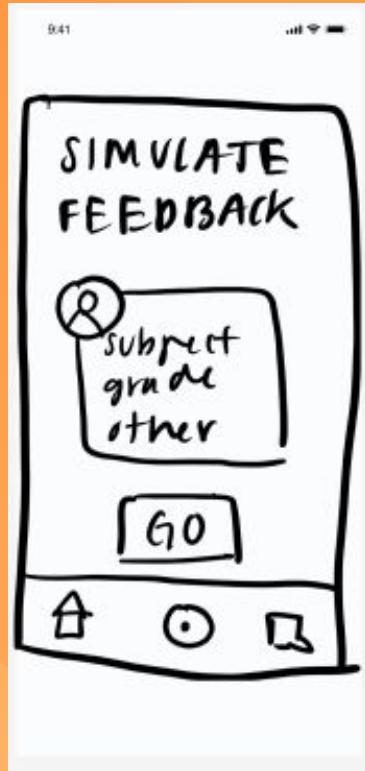
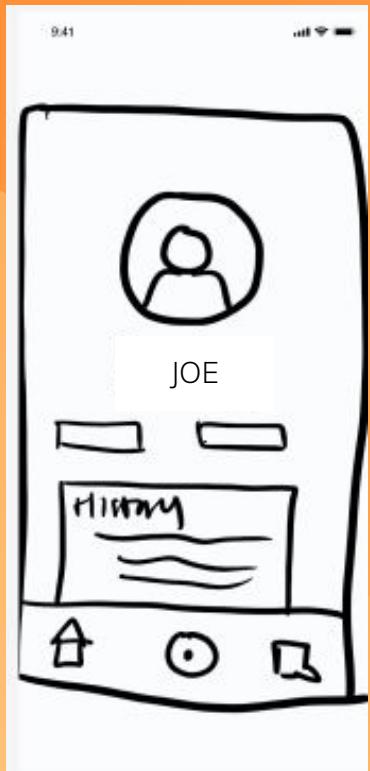
- Describe evaporation as the process in which water changes from a liquid state to a gaseous state (water vapor) and enters the atmosphere.
- Explain that heat energy from the sun causes the water molecules to gain energy, become more energetic, and escape into the air.

4. Condensation:

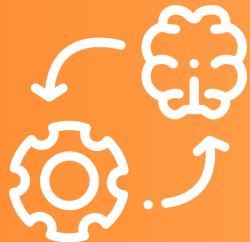
- Explain that condensation occurs when water vapor in the atmosphere cools down and changes back into a liquid state.



3: Feedback Simulator (complex)



Task 3



Participate in teaching and feedback simulation

Q: How do plants get energy?

A: Plants get energy from the soil. They use roots to soak up water and nutrients from the ground. Once the roots absorb these nutrients, they travel up through the stem and into the leaves. Then, the plant can use the nutrients for energy to grow.

Correct answer: Plants use a process called photosynthesis to convert light into food they can use for energy.

The parent's response is generally helpful as it identifies an important process that the student left out, photosynthesis. However, the feedback could be improved by offering more specific information and guidance.

One way to improve the parent's response is to provide a brief and simplified explanation of photosynthesis, so the student can better understand the process. The parent could say something like, "To produce energy, plants use a process called photosynthesis. During this process, plants use the energy from the sun to combine water and nutrients from the soil to produce a sugar called glucose. This glucose is then used by the plant for energy to grow."

Procedure:

- Engage in simulation with AI
- Analyze practice student responses to questions
- Give student feedback on their answers
- Interact with feedback given on the feedback for the student.

Results + Key Insights

1. Time is a key resource: no time for the simulation
2. Privacy concerns: ability to edit input before sending
3. AI is non-threatening: no pressure of judgment
4. Student feedback matters: include them in the process
5. Proxy for expensive Teacher Ed programs

“(as a homeschooling parent)
Your life is very integrated. It’s go go go. You don’t often take time to sit, pause, and look back at what you did. This encourages and forces looking back.” – P1



Next Steps

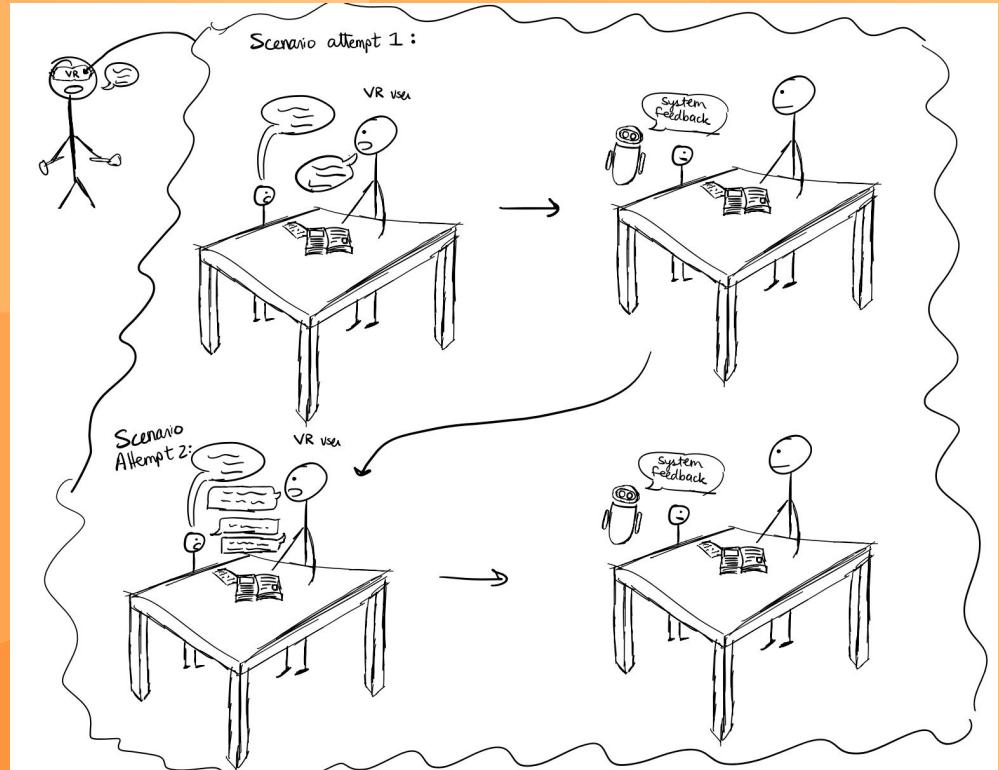
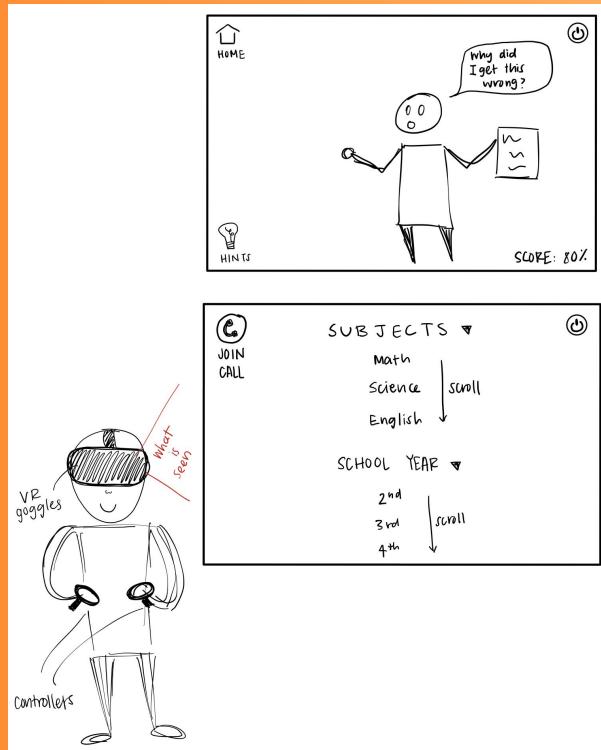
1. Go deeper with the live-lesson feedback agent
2. Consider eliminating feedback simulation
3. Include child feedback about lesson
4. Ensure UI is self explanatory

Thank you!
Questions? Feedback?

Appendix

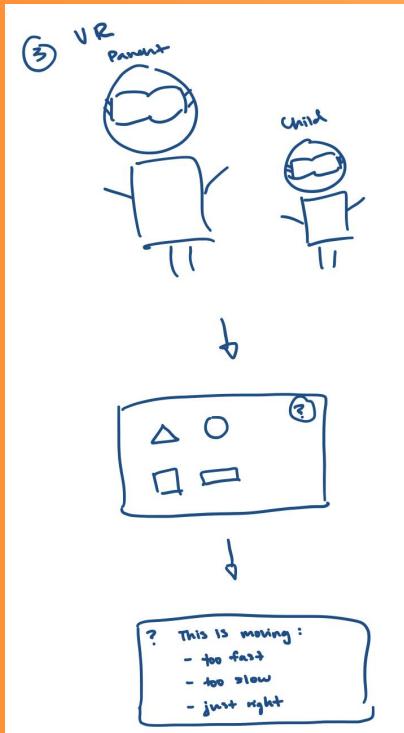
Concept Sketches

Concept Sketches - Virtual Reality

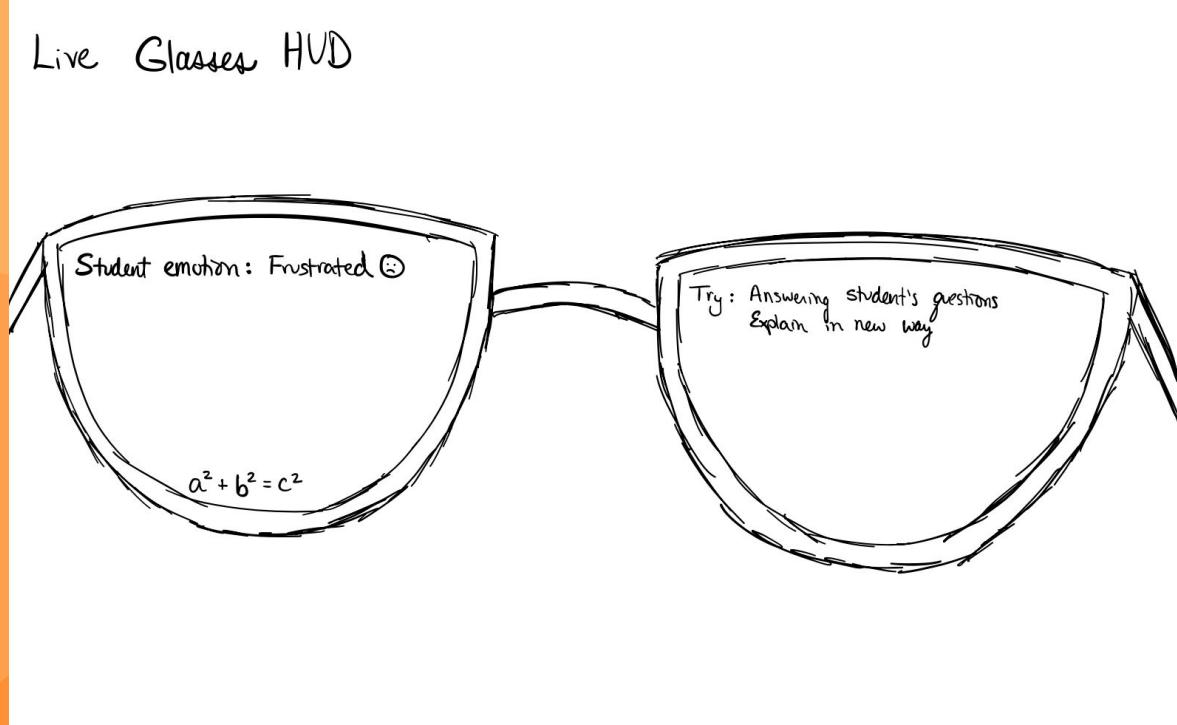


1 and 2: Virtual Reality (VR) for teaching and feedback simulation

Concept Sketches - Virtual Reality / Augmented Reality

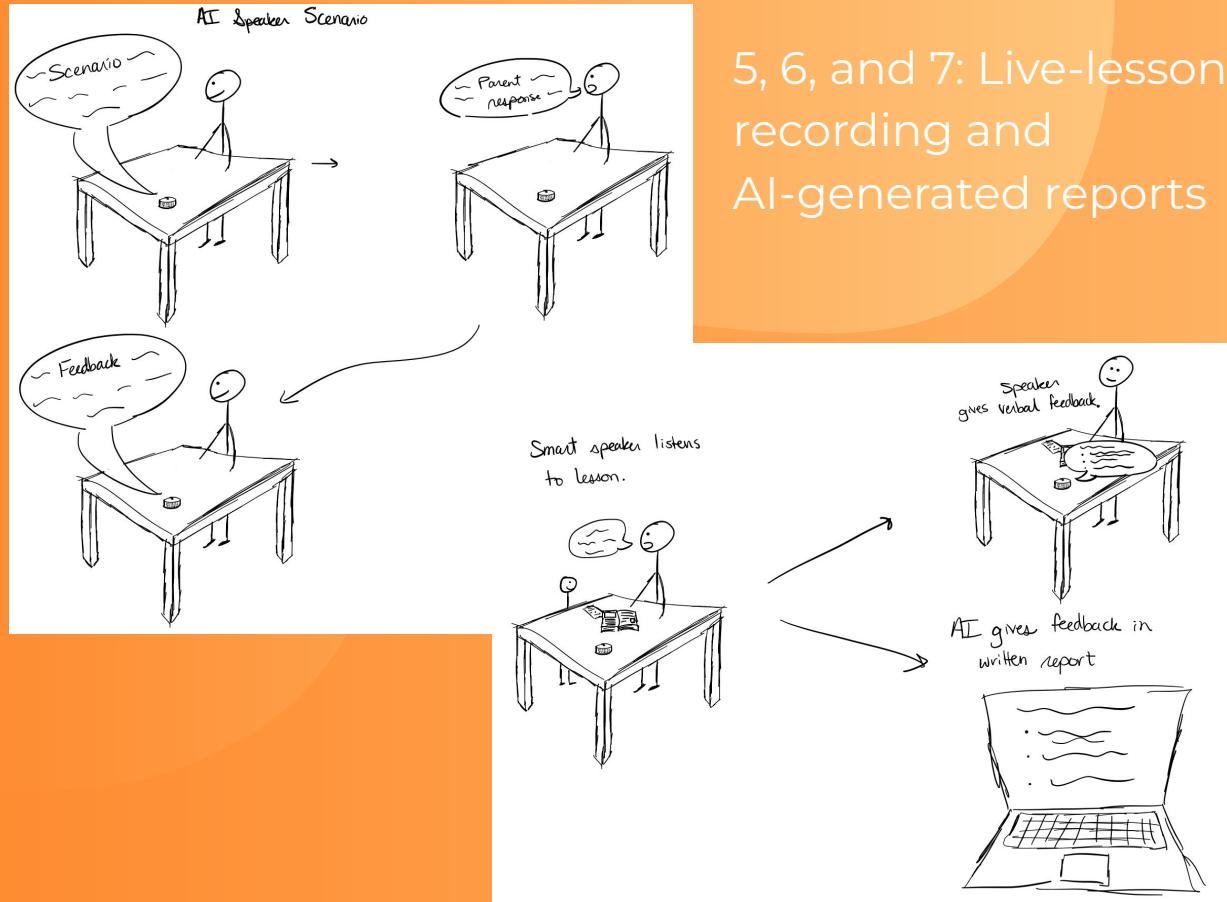


3: Virtual Reality (VR)



4: Augmented Reality (AR) glasses for live feedback

Concept Sketches



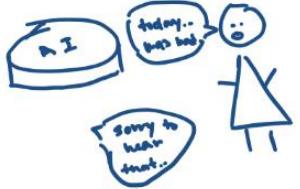
5, 6, and 7: Live-lesson recording and
AI-generated reports



Concept Sketches

②

Voice-activated
assistant
for children to rent to



AI
synthesis

AI → Parent



8: Voice Assistant for live feedback during lessons

Concept Sketches

④ Live Interface

Immediately
Give Feedback

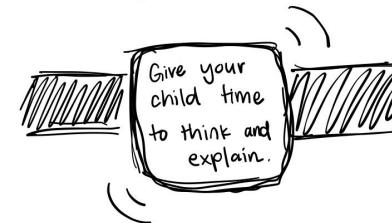


→ AI
Synthesis →



9: Table-top interface
for live feedback

10: Wearables for live
notifications



Concept Sketches

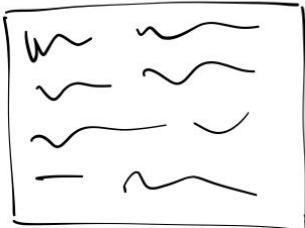
Welcome
Back!

Get feedback

Give feedback

Give Feedback

Submitted Scenario



What went well:

Type here

What could be improved:

Type here

Send Feedback

Get Feedback

Subject

Math

History

Art

Science

Music

English

Grade

Kinder

First

Second

Third

Fourth

Fifth

Sixth

Seventh

Eighth

Ninth

Tenth

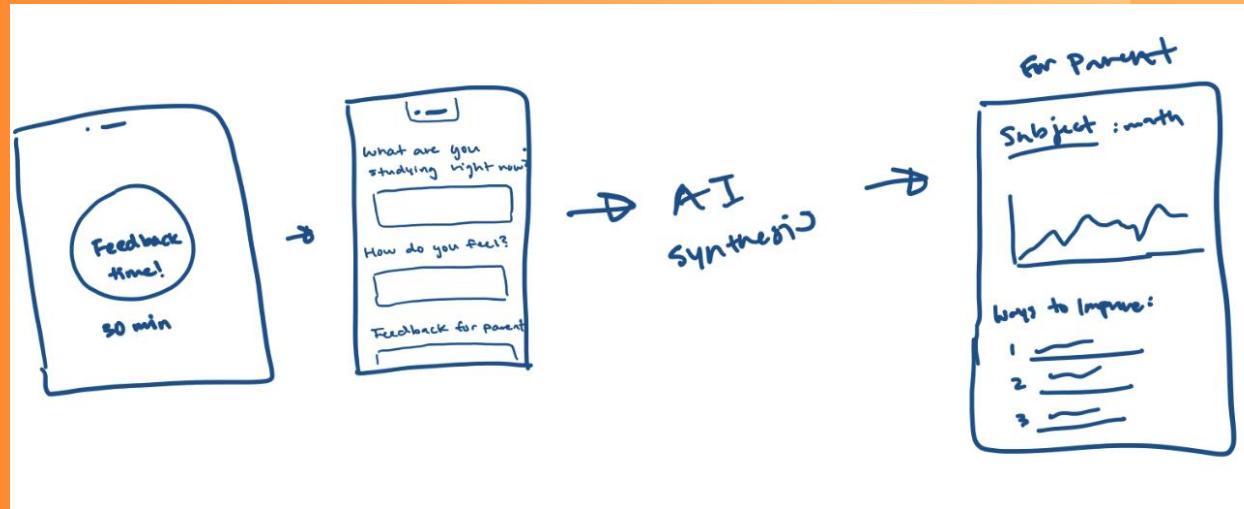
Eleventh

Twelfth

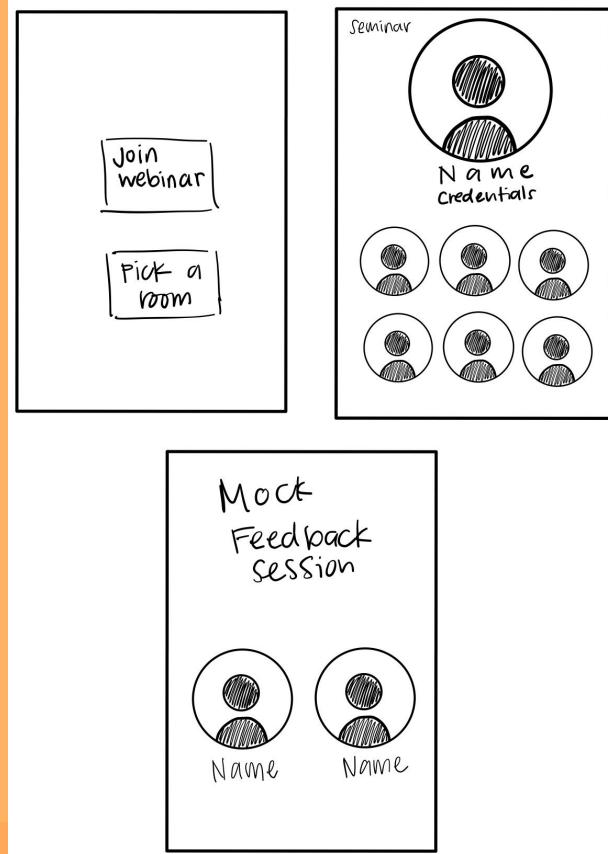
GO!

11: Mobile app for crowdsourced feedback and community

Concept Sketches



12: Mobile app for practicing feedback

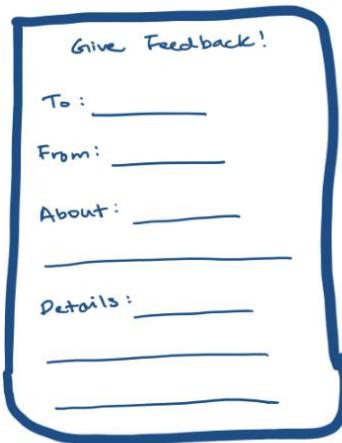
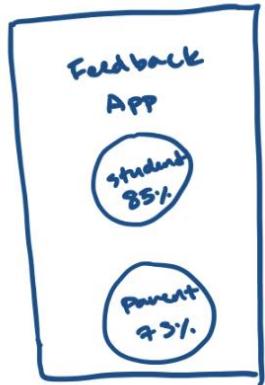


13: Mobile app for live,
mock feedback sessions

Concept Sketches

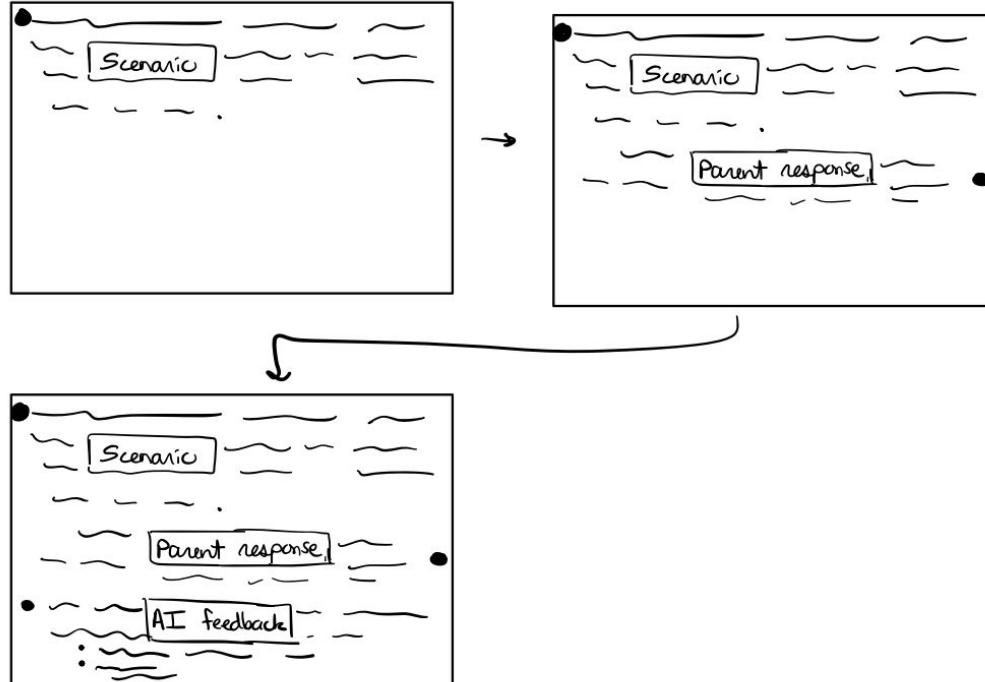
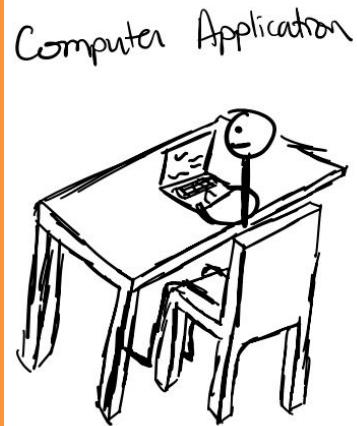
①

Student Gives Parent Feedback



14: Mobile app for performance analysis of teaching and giving feedback

Concept Sketches



15: Web app for teaching and feedback simulation

Prototype

<https://www.figma.com/file/oCOuG|ZPxVFXkWoMFWCuR/CS377E?type=design&node-id=0-1&t=TDS2qfFB1HWxae0W-0>

Results

1. Simulation took too long
2. Concerns about privacy with recording
3. Parents appreciated having a consolidated resource – would like as much streamlining as possible
4. Liked live use case - can take it on the go
5. Audio recording does not capture visual aid use
6. Having examples of “good” teaching and feedback would be nice

Key Insights

1. Time is a key resource: no time for the simulation
2. Privacy concerns: ability to edit input before sending
3. AI is non-threatening: no pressure of judgment
4. Student feedback matters: include them in the process
5. Reports help parents to take the time to reflect
6. Proxy for expensive Teacher Ed programs
7. Building confidence leads to self-efficacy

“(as a homeschooling parent)
Your life is very integrated. It’s go go go. You don’t often take time to sit, pause, and look back at what you did. This encourages and forces looking back.” – P1

